e-Front runners

高融点合金溶製・鋳造装置

Alloy Casting Machine for High-melting-point Metals

Universal Caster FCC-50

高融点合金溶製装置

Melting Machine for High-melting-point Metals

Universal Melter FCM-50

様々な分野の技術革新が加速するなか，金属材料開発の分野でもタイムリーな新素材の市場投入が求められています。
一方，新素材開発は，あらゆる金属の無数の組合せの中から最適な組合せを探す作業であり，膨大な時間を必要とします。
本装置は，複数の金属母材から極短時間で合金を溶製し，精密鋳造体をスピーディに提供します。

Technical innovations are being accelerated in various fields. In the field of development of metallic materials, it is also required to bring new materials timely into the market.
Development of new materials, meanwhile, is a task of finding out optimum combination of metals from numerous combinations, which requires immense amount of time.
This device melts multiple metallic base materials, thus providing precision casts in an extremely short time.

特長

- これまでは合金化が難しかったTi-Ta系に代表される高融点で比重差が大きい金属でも，所定の成分にて均一な合金の溶製と精密鋳造ができます。
- 溶解中にるつぼからの汚染がないので，溶製された合金はるつぼか非常に高純度です。
- 溶湯温度は常に最適な鋳造温度となりますので，オーバーヒートの心配がなく，品質の安定した鋳造品が簡単に作成できます。
- 移動・設置が簡単なコンパクト構成です。

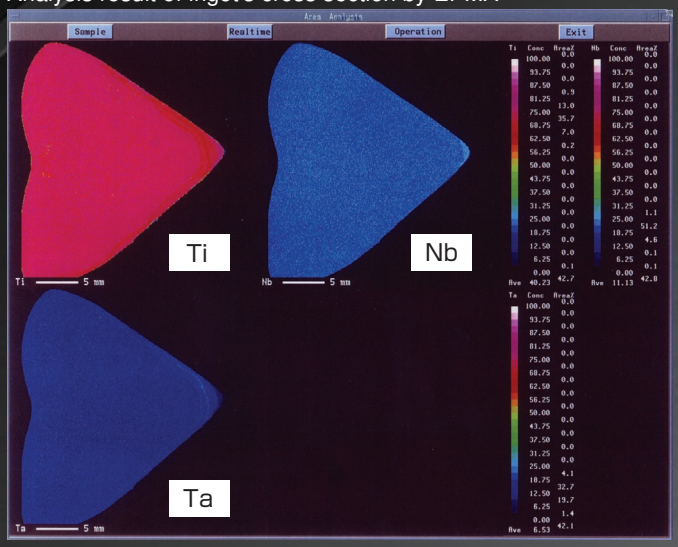
Features

- Even high-melting-point metals with significant specific gravity difference typified by Ti-Ta-series metals, which have so far been difficult to be cast into an alloy, can be cast into a uniform precision alloy with specified components.
- Since there is no contamination from the melting crucible during melting, extremely high purity of alloy ingot is assured.
- Since molten metal temperature is always kept optimum for casting, casts of stable quality can be produced easily without worry about overheating.
- Compact structure allows easy transportation and installation.

高融点合金溶製事例
Example of melting into an alloy of high-melting-point metals

- Ti-Ta　● Ti-Nb
- Ti-Ta-Nb
- Ti-Ta-Nb-Zr

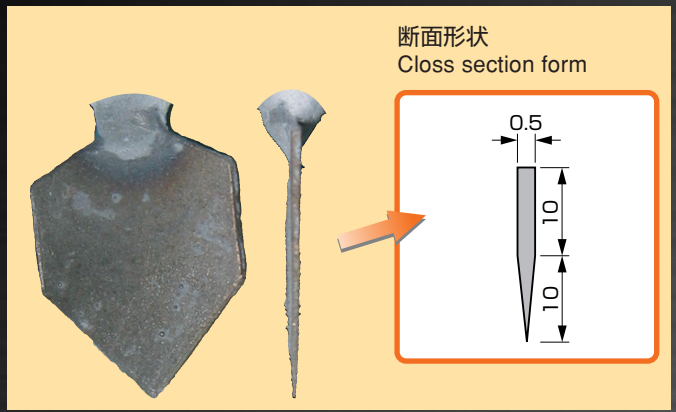
EPMAによるインゴット断面の面分析結果
Analysis result of ingot's cross section by EPMA



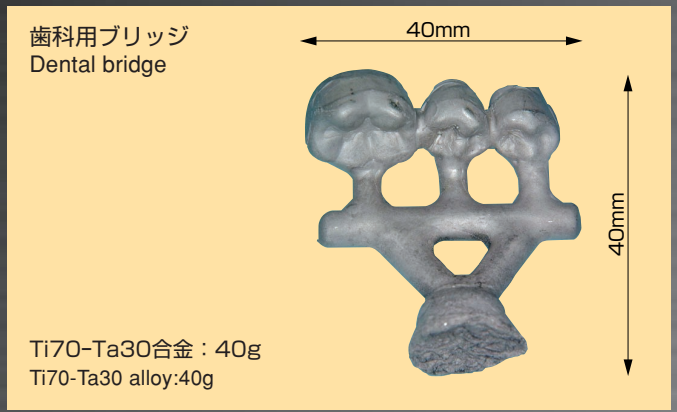
Ti70-Nb20-Ta10(wt%)

高融点合金鋳造事例
Example of casting into an alloy of high-melting-point metals

鋳造試験片 Casting test specimen



歯型鋳造事例 Example of denture mold casting



コンパクトながら精密鋳造機構を装備！
Provided with compact yet precise casting mechanism

装置構成 Structure

装置仕様 Specifications

	Universal Caster	Universal Melter
るつぼ Crucible	水冷るつぼ Cold crucible	
溶解量 Melting capacity	定格 Ti 50ｇ（Max.100ｇ） Rating: Ti 50g (100g max.)	
溶解時間 Melting time	約20秒 About 20 seconds	
電源容量 Power capacity	50kW	
溶解実績 Melting performance	イリジウム（融点：2460℃），ニオブ（融点：2470℃） Iridium(Ir) (melting point:2460℃), Niobium(Nb) (melting point:2470℃)	
精密鋳造機構 Precision casting mechanism	反転出湯，鋳造時圧力制御機能付き Rollover tapping, With mould pressurizing/depressurizing mechanism	なし None
反転機構 Rollover mechanism	自動・手動切換式 Auto/manual switching type	なし None
鋳造鋳型 Casting mould	開発仕様専用鋳型材または市販鋳型材 Exclusive self-developed casting mould (or those on the market)	なし None
寸法 Dimension (W×D×H) [mm]	1100×1700×1750	850×1000×1550
質量 Mass [kg]	約1000 About 1000	約700 About 700
主な用途 Major application	新合金系の溶製・試験片製作 Manufacturing of new alloy series ingots/test specimens	

高融点・比重差の大きな合金を均質に溶製！

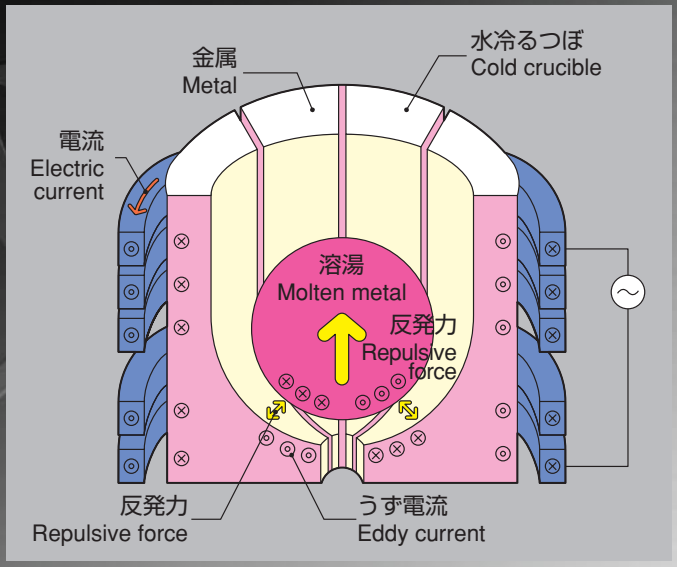
Uniform casting of an alloy allowed with metals of high-melting-point and large specific gravity difference

浮揚溶解原理

コイルに印加する高周波電流による誘導加熱を行うと同時に，電磁反発力を利用し，溶湯とるつぼを非接触状態に保ちます。

Principle of melting and casting

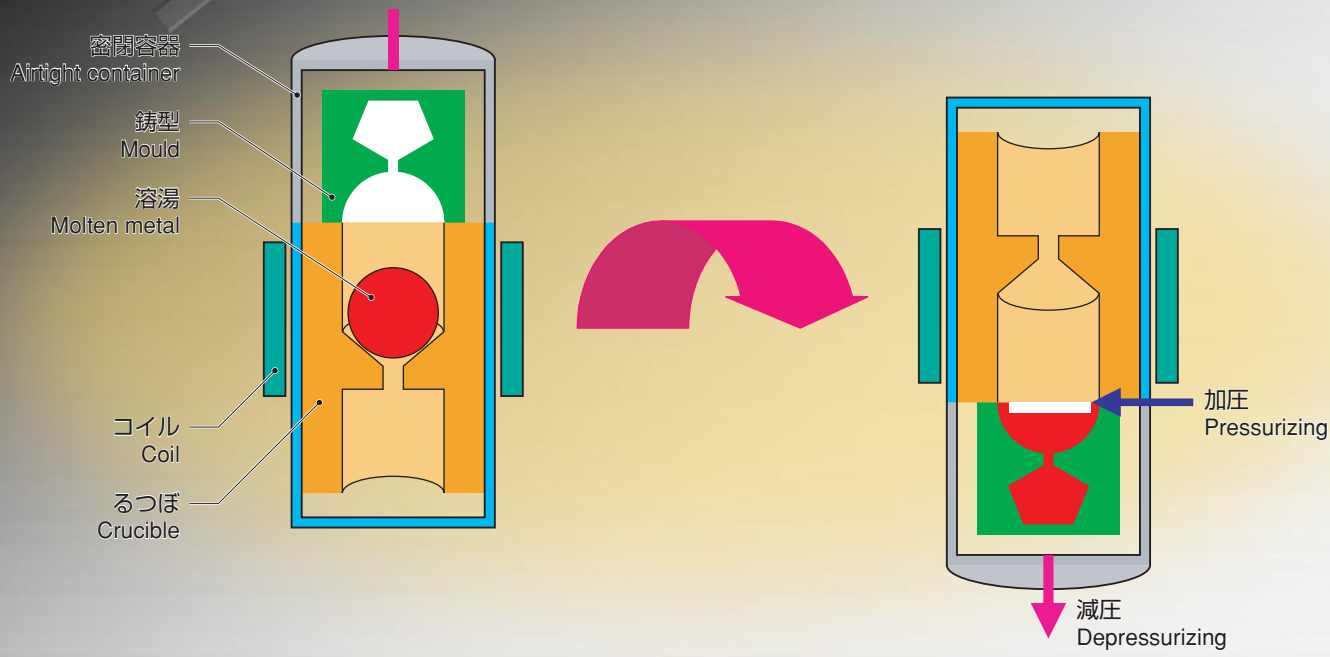
Induction heating is performed with high-frequency current applied to the coil, while the molten metal and the crucible are kept apart from each other by electro repulsive force.



鋳造原理 Concept of casting

溶解・合金溶製完了
Completion of melting and casting into an alloy

反転出湯・加圧鋳造
Rollover tapping/pressure casting



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